

2013 Nobel Prize Nomination Letter

Dear Royal Swedish Academy of Sciences,

I would like to nominate Prof. Peter Higgs of University Edinburgh, Prof. François Englert of Université Libre de Bruxelles for 2013 Nobel Prize in Physics. Prof. Higgs and Prof. Englert along with Prof. Robert Brout who passed away in 2011 proposed the idea of Higgs field and thus predicted the existence of Higgs boson. Their theory tried to explain how mass is formed in local gauge theories.

In the sixties, three papers, written by Rober Brout and François Englert, Peter Higgs, and Gerald Guralnik, Carl Richard Hagen and Tom Kibble, proposed three different approaches to the formation of the mass of subatomic particle. Despite their different approaches, they proposed the same mechanism which is known as Higgs mechanism. By introducing Higgs field in this mechanism, certain symmetry laws of electroweak interaction are broken. This explains why the weak force is massive but only has very short range. Higgs field thus serves as a field which gives subatomic particles mass: Those particles interact more with the field have more mass and those who interact less have little mass.

In their theory, Higgs boson is the essential particles originated from the Higgs field. On 4 July, 2012, two teams at CERN reported independently that an unknown particle is detected: CMS team reported a particle of mass $125.3 \text{ GeV}/c^2$ and ATLAS team reported a particle of mass $126.5 \text{ GeV}/c^2$. Later on, CERN announced that the particle is tentatively confirmed as Higgs boson. This discovery essentially proves the idea of Higgs field and Higgs mechanism.

Due to this major breakthrough, I would like to nominate Prof. Peter Higgs and Prof. François Englert for 2013 Nobel Prize in Physics.

Sincerely,

Yiqing Ding